



Hiperco 50A

Soft Magnetic Alloys

DESCRIPTION

Hiperco® 50A, an iron-cobalt vanadium soft magnetic alloy provides superior magnetic properties when compared to other soft magnetic alloys. Hiperco 50A key properties include the highest magnetic saturation of 24 kilogauss while sustaining low core loss. Often this alloy can be found in motors and generators to improve the motor's power density and efficiency while providing a reduction of motor size.

APPLICATIONS

Motors and generators; Actuators; Specialty transformers; Electromagnetic pole pieces.

TYPICAL PHYSICAL PROPERTIES

Density	lb/in ³	0.293
Specific Gravity	68 F	8.12
*Curie Temperature	F	1720
	C	938
Electrical Resistivity (70 F)	ohm-cir mil/ft	240.7
	(21 C) ohm-m	40.1x10 ⁻⁸
Elastic Modulus	ksi	30x10 ³
	GPa	206.8
Thermal Conductivity	BTU-in/sq.ft-hr- F	206.8
	W/cm C	29.83
Mean Coefficient of Thermal Expansion	77 to 392 F	5.3x10 ⁻⁶ length/length/ F
	77 to 752 F	5.6x10 ⁻⁶ length/length/ F
	77 to 1112 F	5.8x10 ⁻⁶ length/length/ F
	77 to 1472 F	6.3x10 ⁻⁶ length/length/ F

*Curie temperature is phase transition from magnetic to non-magnetic phase.
Source: Carpenter Electrification® Hiperco 50A Datasheet v05-20

FORMS | SIZES AVAILABLE

Round Bar Rod	0.510" - 2.750"
Plate*	0.500" - 7.0"
Strip Coil	0.006" - 0.014"

*Plate is cut from unannealed billet.
Listed above are our standard stock items. Our inventory fluctuates based on market demands. If you do not see the size or form you require, please call us

TYPICAL MECHANICAL PROPERTIES - 0.014 IN STRIP

HEAT TREATMENT		Cold Rolled Unannealed	Standard Magnetic Anneal
Ultimate Tensile Strength	ksi(MPa)	195 (1344)	72.2 (498)
Yield Strength 0.2%	ksi(MPa)	185 (1276)	30.8 (202)
Elongation	% in 2 in.	1	6.7

Source: Carpenter Electrification® Hiperco 50A Datasheet v05-20

TYPICAL DC MAGNETIC PROPERTIES - 0.014 IN STRIP

HEAT TREATMENT	COERCIVITY (A/m) from 8 kA/m	DC RELATIVE Permeability μ_{max}	B (TESLA) A/m					
			400	800	1600	4000	8000	16000
Standard Ferromagnetic Annealing	30	22000	2.12	2.19	2.23	2.27	2.28	2.30

Source: Carpenter Electrification® Hiperco 50A Datasheet v05-20

TYPICAL DC MAGNETIC PROPERTIES - BAR (BULK MATERIAL)

HEAT TREATMENT	COERCIVITY (A/m) from 8 kA/m	DC RELATIVE Permeability μ_{max}	B (TESLA) A/m					
			400	800	1600	4000	8000	16000
Standard Ferromagnetic Annealing	209	3350	1.49	1.80	2.00	2.18	2.25	2.30

Source: Carpenter Electrification® Hiperco 50A Datasheet v05-20

TYPICAL AC CORE LOSS BY HEAT TREATMENT - 0.014 IN STRIP

HEAT TREATMENT	SPECIFIC CORE LOSS		
	60 Hz	400 Hz	1000 Hz
Standard Ferromagnetic Annealing	0.94	12.7	55.6
	1.75	30.0	151.0
	2.73	56.8	313.0

Source: Carpenter Electrification® Hiperco 50A Datasheet v05-20

CHEMISTRY %

(Single figures are nominal except where noted.)

Cobalt 48.5, Vanadium 2.0, Niobium 0.01, Carbon 0.001, Iron Balance

SPECIFICATIONS

ASTM A801 Alloy Type 1 - MIL A 47182



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